

# Ohio River Basin Ecosystem

## *Fiscal Year 2000 Annual Report Region 3*



--USFWS Photo by Scott Flaherty

*Little Otter Creek winds its way through Big Oaks National Wildlife Refuge in southern Indiana. The new Refuge comprises 50,000 acres of the former Jefferson Proving Ground, a U.S. Army ordnance testing site.*

### Ecosystem Description

The Ohio River Basin drains a total area of approximately 141,000 square miles (excluding the Tennessee and Cumberland river watersheds as well as the New River drainage in the western portions of Virginia and North Carolina) and includes portions of Illinois, Indiana, Kentucky, Maryland, New York, Ohio, Pennsylvania, Tennessee, Virginia, and West Virginia. The Ohio, the ecosystem's primary river, is formed by the confluence of the Allegheny and Monongahela rivers at Pittsburgh, Pennsylvania. Major tributaries flowing into the Ohio, from upstream to downstream, include the Muskingum, Kanawha, Guyandotte, Big Sandy, Scioto, Licking, Great Miami, Kentucky, Green, and Wabash rivers. The Ohio flows 981 miles in a southwesterly direction, joining the Mississippi River at Cairo, Illinois.

The Ohio Basin can be divided into three parts, corresponding to the Basin's three major physiographic provinces. The Appalachian Plateau in the eastern portion is characterized by rugged topography resulting largely from the erosion of flat-lying rocks. The permeable sand and gravel deposits in the valleys of the drainage system provide moderate groundwater supplies. The area has extensive forest cover, generally poor quality soils, narrow valleys, steep stream gradients, flash floods during the rainy season, and low stream flows during dry seasons.

The Central Lowlands occupies the northwestern third of the Basin and is the result of several glaciations. Glaciers covered most of the area in recent geologic history, and left soil deposits which are now some of the richest agricultural lands in the Basin. The topography is flat to slightly rolling and the drainage pattern has been significantly altered from its original, pre-glaciation condition. In some instances, buried pre-glacial streams provide extensive groundwater resources.

The Interior Low Plateau in the southwestern third of the Basin is dominated by limestone rock which covers most of this region. This has resulted in the rolling terrain forming the Lexington Plains and Blue-grass regions where farming dominates. Areas of local rugged relief are forested, their soils thin. Groundwater has the typical variability of limestone areas.

Three other physiographic provinces are represented over a small areal extent in the Basin. The Valley and Ridge and the Blue Ridge provinces occur in the southeastern-most parts of the Basin, and the Gulf Coastal Plain province occupies the lowermost part of the Basin where the Ohio joins the Mississippi River.

### Biological Resources

The Ohio River basin bisects three regions of the Deciduous Forest Formation of eastern North America: the Mixed Mesophytic Forest Region (upper basin, roughly upstream of Portsmouth, Ohio), the Western Mesophytic Forest Region (lower basin from Portsmouth, Ohio, to Paducah, Kentucky), and the Mississippi Alluvial Plain Section of the Southeastern Evergreen Forest Region (lowermost portion of the basin from Paducah, Kentucky, to Cairo, Illinois).

The mixed mesophytic and western mesophytic forests have been classified broadly as a tulip poplar-oak region. The dense, mixed mesophytic forest contains a fair abundance of two indicator species, white basswood and yellow buckeye, in a total group of 15 to 20 dominant species. The western mesophytic forest is marked by a transition from extensive mixed mesophytic communities in the east to extensive oak and oak-hickory communities in the west. The western mesophytic forest is less dense, has few dominants, and usually lacks the two indicator species of the mixed mesophytic forest.

In the lower, downstream portion of the ecosystem, near Paducah, Kentucky, the Ohio River enters the northernmost extension of the Mississippi Alluvial Plain. In this alluvial region, three subdivisions of "bottomland forest" (i.e., palustrine forested wetland) are recognized: swamp forest, hardwood bottoms, and ridge bottoms. The swamp forest, consisting principally of cypress and tupelo gum, occupies land on which water stands throughout the year except during periods of extreme drought. The hardwood bottoms contain a large number of species, frequently flood, and generally remain covered with water through the late winter and spring. Ridge bottoms contain some of the tree species of hardwood bottoms, but have a larger number of oaks and hickories; occurring at slightly higher elevations than hardwood bottoms, these areas are covered by water only during floods.

The rich flora and fauna of the ecosystem reflect its diverse physiography and unique geologic past. Numerous Service trust resources occur in the ecosystem, including many federally listed endangered/ threatened plants, mussels, fishes, birds and mammals; waterfowl and other migratory water birds; and neotropical migratory land birds.

The unusually rich and diverse fauna found in the ecosystem is the product of a multitude of biotic and abiotic factors which have evolved over time. Throughout geologic time, changes in such factors as topography, climate, and geomorphology have formed, modified, and eliminated habitats and consequently have had a profound effect upon the distribution of the faunal assemblages in the ecosystem. Due to the ecosystem's central geographical location in the eastern United States, some species with northern affinities and others with southern affinities occur in the ecosystem in addition to those common to the central region of the country.

**Stresses** Much of the region's economic activity—agriculture, lumbering, mining, and recreation—is based on the watershed's natural resources. Sustaining most of these activities requires maintenance of a healthy ecosystem. Stress from human activities has adversely affected the ecological integrity of the ORVE, and there are indications that this stress is increasing.

Environmental alteration and degradation are continuing challenges to the maintenance of a productive and healthy ORVE. Resources of the area are threatened by land conversion, poor land-use practices, direct and indirect physical alteration of the area's rivers and streams, acid mine drainage, destruction of wetland habitats, and both point- and nonpoint-source discharges of pollutants. Herbicides, insecticides, nutrients, and sediment are significant components of the agricultural runoff that adversely affect aquatic systems throughout the area. Acid precipitation and other airborne pollutants are having dramatic effects on aquatic and terrestrial communities, particularly at high elevations. Natural resources are further threatened by an expanding human population and its increased demand for renewable and nonrenewable resources. Contamination of both aquatic and terrestrial systems through acid mine drainage and the accidental release of toxic chemicals is a continuing threat. Operation and maintenance of the inland navigation system and the recent invasion of the non-indigenous zebra mussel are having significant adverse impacts on native flora and fauna of the area's rivers and streams. Other non-indigenous species are threatening native components of aquatic and terrestrial systems throughout the area. The expansion of urban and suburban areas within the ecosystem and the concurrent loss of forest, wetlands, agricultural lands, and other types of open space associated with this expansion have reduced the quantity and quality of natural habitats available to fish and wildlife.

Given the abundance of ecosystem-altering influences past and present, a coordinated landscape-scale effort is necessary to reverse and prevent further declines in biological resources. A healthy ecosystem will provide much more diverse flora and fauna. It will provide clean air and water; healthy soil; sustainable harvests from forests and fields; and abundant outdoor recreational opportunities for this and future generations. Through the efforts of the Service and other partners, the ORVE can become a healthier ecosystem and a model of how socioeconomic objectives can be accomplished without sacrificing the environment.

### The Ohio River Valley Ecosystem Team (ORVET)



-USFWS Photo by Teresa Vanosdol-Lewis

*Biologist Jason Lewis measures nest site characteristics for Henslow's sparrows at Big Oaks NWR in southern Indiana.*

The Ohio River Valley Ecosystem (ORVE) includes portions of 10 states and straddles three Service Regions (Region 5, Northeast; Region 4, Southeast; and Region 3, Great Lakes-Big Rivers). The ORVE Team is composed of Service personnel from each Region, and is charged with the development and implementation of a strategic plan for conserving Service trust resources in the ecosystem.

The Team's mission is to work cooperatively with other government agencies and the private sector for the conservation of the ORVE's native animal and plant diversity through perpetuation of a dynamic, healthy ecosystem. The Team's broad goals for the ORVE are:

- Protect, restore and enhance habitats and essential processes necessary to maintain healthy native animal and plant populations.
- Protect, restore and enhance diversity of native flora and fauna.
- Promote and support compatible and sustainable uses of the ecosystem's resources and utilize existing laws, regulations, and influence to control incompatible and unsustainable uses of these resources.
- Develop public awareness and support for ecosystem resource issues.

In support of these goals, the Team has established seven Resource Priorities and a Public Use priority for the Ecosystem:

- Priority 1: In cooperation with partners, reverse the decline of native aquatic mollusks within the ORVE with emphasis on endangered, threatened and candidate species and species of concern.
- Priority 2: In cooperation with partners, reverse the decline and achieve stable, viable populations of migratory landbirds and other bird species of concern.
- Priority 3 : In cooperation with partners, reverse the decline of native fishes with emphasis on interjurisdictional listed and candidate species and species of concern.
- Priority 4: In cooperation with partners, protect and restore karst/cave habitat supporting listed and candidate species and species of concern.
- Priority 5: In cooperation with partners, protect and restore wetland, riverine and riparian habitat in the Ohio River watershed for the protection and enhancement of migratory waterbirds and other wetland dependant species of concern.
- Priority 6: In cooperation with partners, reduce the decline and promote the recovery of rare resources identified as listed/proposed

threatened and endangered species, candidate species and species of concern<sup>1</sup>not otherwise addressed in Resource Priorities 1- 5 (e.g. plants, reptiles, amphibians, etc.).

- Priority 7: In cooperation with partners, achieve the necessary level of protection for those high priority areas within the ORVE that would help meet the goals of the ORVE Team. In particular, emphasis will be placed on the objectives of Resource Priorities #s 1 through 6 and Public Use Priority #1.
  - Public Use Priority 1: In cooperation with partners, promote and support sustainable fish and wildlife-oriented recreational uses while maintaining the long-term health of the ecosystem and the Service's trust resources.
-



### Summary of Fiscal Year 2000 Accomplishments

**Ecosystem Focus Areas:** Team sub-groups are working to identify high priority geographic areas within the ORVE that are important in meeting the sub-group goals and objectives. These "Focus Areas" were presented at the June Team meeting and further refined at the September meeting. It is expected that identification of these Focus Areas will help set future team priorities.

#### Freshwater Molluscs

##### Cooperative Zebra Mussel Monitoring Network

Since 1995, the Service has been working side by side with the states of West Virginia, Ohio, Kentucky, Indiana and Illinois, along with the US EPA, Corps of Engineers, and volunteers, tracking the status of zebra mussels and their effects on our native mussel fauna. Ten federally listed species occur in the mainstem Ohio River; and the monitoring network has documented serious declines in native mussels in the middle and lower river. In Fiscal Year 2000, the sixth annual cooperative zebra mussel monitoring was conducted.

##### Ohio River Mussel Poster

Along with the states of Kentucky, Ohio, Indiana, Illinois, and West Virginia, the TVA, the Freshwater Mollusk Conservation Society, and private Mussel Mitigation Trust, the Service helped draft and produce a full color poster highlighting the conservation needs of the Ohio River's native mussel fauna. Fifteen thousand copies of the poster were distributed throughout the ORVE.

##### Endangered Species Rescue



-USFWS Photo by Scott Flaherty

*The three-ridge mussel, (Amblima plicata) is found throughout the midwest. Settlements resulting from prosecution of freshwater mussel poachers are helping fund conservation programs for mussels in the Ohio River Valley ecosystem.*

Recovery efforts for endangered species along the 981-mile-long Ohio River is a daunting task. The U. S. Fish and Wildlife Service (Service), along with the States of Illinois, Indiana, Ohio, Kentucky, West Virginia, and Pennsylvania, and other partners are developing a strategy for relocating endangered mussels at risk in the mainstem Ohio River to safe havens in selected mainstem areas or in tributaries with minimal zebra mussel infestation. Projects funded in Fiscal Year 2000 toward that goal include:

- A grant agreement with Dr. Jim Sickel to facilitate the protection of endangered unionids from zebra mussels and other habitat perturbations and re-establish breeding populations in the Ohio River basin by relocating endangered and non-endangered unionid species from the Ohio River into a refuge in the Kentucky Dam tailwater. Funding (\$21,500) for this study was provided through Region 5 flex funds. The grant agreement was finalized in September 2000.

- A cooperative agreement with Dr. Tim King at the U. S. Geological Survey - Biological Resources Division (USGS-BRD) Leetown facility to develop microsatellite DNA markers for *Lampsilis abrupta* (Pink mucket.) Phase I (marker development) was funded through Region 4 flex funding (\$15,000). The cooperative agreement was finalized in August. Phase II (population survey and broodstock screening) requires an additional \$15,000 and has not yet been funded. This project is a partnership between USGS, Service, Tennessee Wildlife Resources Agency, and Alabama Department of Conservation and Natural Resources. The salaries of the three Principal Investigators and the state-

### Summary of Fiscal Year 2000 Accomplishments

of-the-art equipment available in the BRD components genetic laboratory are considered matching funds.

- **Propagation of juvenile mussels:** As part of its focus on the propagation of freshwater mussels, the ORVE Team funded, through its kitty, a study of optimum feeding conditions for maintaining captive unionids: a study of an anodontine, an amblemine, and a lampsiline unionid. This research was possible through the cooperative efforts of the Service, the American Zoo and Aquarium Association (AZA), the Patrick Center for Environmental Research at the Philadelphia Academy of Natural Sciences, and Virginia Tech. Thus far, Dr. Kreeger at the Academy of Natural Sciences was awarded \$20,000 from the AZA to pay for labor and supplies. The study is underway.

- **Wild Turkey Spill:** A recent fire at the Wild Turkey distillery resulted in a spill of more than 200,000 gallons of whiskey into the Kentucky River. This spill resulted in a 5 to 7 mile-long slug of anoxic water that traveled slowly down the river from Frankfort, Kentucky to the river's confluence with the Ohio River. The ORVE has a dive team from Ohio River Islands NWR that will work with the State of Kentucky to survey the extent of impacts to freshwater mussels in the Kentucky River.

### Migratory Birds

#### GAP Metaproject

The ORVE Migratory Bird Subgroup, which includes a variety of federal and state agency and conservation group partners, initiated the ORVE Migratory Bird Resource Priority GAP Metaproject to identify areas of importance to species of migratory birds. The target bird species are mainly songbirds that winter in South America or Latin America and breed or inhabit the Ohio River Watershed during the spring and summer. The GAP metaproject will identify areas in the ORVE that are of particular importance to these species of birds and present the information in an ArcView GIS database.

#### Reclaimed Strip Mine Grasslands



--USFWS Photo

*Not quite a week old, this young Henslow's sparrow was banded by Service biologists at Big Oaks NWR.*

The second year of a grassland/savanna bird productivity monitoring in strip mines, approximately 500 nests of 28 species were monitored. Good sample sizes were attained for red-winged blackbirds, eastern meadowlarks, field sparrows, grasshopper sparrows, Henslow's sparrows, mourning doves, and brown thrashers. Twenty Henslow's sparrow nests were found, and a thermal imager was used to enhance nest location for ground nesters (e.g., Henslow's sparrows and grasshopper sparrows). There was very little cowbird parasitism for the grassland species monitored. Most nest losses were due to predation and weather. Overall, nest success was comparable to that found in other studies of grassland and savanna birds in the Midwest, and the investigators tentatively concluded that strip mine-using grassland birds are doing at least as well as grassland birds in any non-mine grassland habitat. Data are in the process of being analyzed, and a final report will be prepared.

## Summary of Fiscal Year 2000 Accomplishments

### Grassland Bird Studies

Several other grassland bird studies were coordinated/reviewed by ORVE team members. Two separate Henslow's sparrow studies were initiated in Kentucky, and monitoring work continued at Big Oaks NWR, formerly Jefferson Proving Ground. The study at Big Oaks NWR has monitored 77 Henslow's sparrow nests during the last three years. This study has indicated that Henslow's sparrows can successfully nest in grasslands treated with prescribed fire during the treatment year, and nesting densities are highest the season following the prescribed fire treatment. Also, some data at Big Oaks NWR indicate that mowing could decrease nest densities and be a less desirable treatment for nesting Henslow's sparrows.

### Trust Fishes

#### Paddlefish

The ORVE team funded purchase of paddlefish tagging equipment to expand the ability of Kentucky fishery biologists to increase tagging efforts in sampling gaps identified in the MICRA Mississippi River Basin Paddlefish Stock Assessment. The project was funded by the ORVE Kitty.

#### Imperiled Species

Lists were prepared of fish species that are endemic, endangered, imperiled, and/or species of concern. These lists are currently under review by the subgroup.

#### Crystal Darter

A population genetics study of crystal darter in the Elk River of West Virginia was completed in Fiscal Year 2000. The study supports the conclusion that this population is unique and warrants protection under Endangered Species Act. As a result, the listing process on this species will be initiated.

### Olmstead Lock and Dam

Potential stakeholders have been identified in the effort to develop a baseline fisheries monitoring plan to measure the effects of Olmstead Lock and Dam on the lower Ohio River. A meeting is planned for late fall with the Corps of Engineers.

### Cave/Karst Habitat

#### GIS Data Layer

Data from all of the states regarding the presence of limestone have been submitted to the team's GIS person, Kurt Snider. From this data, Kurt has developed a cave/karst GIS data layer for the ORVE. A map can be readily generated from this data layer. Presently the information is most important in identifying focus areas for the ecosystem.

#### Web Page

The subgroup has provided the information necessary to develop a Cave/Karst page on the ORVE web site.

### Gating Waterfall Cave

At the recommendation of the Cave/Karst Subgroup, the ORVE Team funded Mr. Roy Powers to design and direct construction of an angle iron gate on Waterfall Cave located on the Daniel Boone National Forest in Rockcastle County, Kentucky. Waterfall Cave is a Priority II hibernaculum for the endangered Indiana bat, where the Indiana bat (*Myotis sodalis*) population had recently fallen from 1,200 to 600. The reason for the decline in the population was human disturbance. Part-



## Summary of Fiscal Year 2000 Accomplishments

### Virginia Big-Eared Bats



-USFWS Photo by Teresa Vanosdol-Lewis

*A miniature radio transmitter is  
afixed to the back of a lactating  
female Indiana bat.*

ners in the project included the U.S. Forest Service, the American Cave Conservation Association, the Kentucky Department of Natural Resources, and the Service's Canaan Valley NWR and the Asheville, NC Field Office.

Although not located in or directly funded by the ORVE, numerous personnel from the ORVE were involved in the construction of angle iron gates at the entrances of Schoolhouse, Hoffman School, and Minor Rexrode Caves in Pendleton County, West Virginia. This project was lead by the Service's West Virginia Field Office, in partnership the West Virginia Division of Natural Resources' Non-Game Wildlife and Natural Heritage Program. The gates will permanently protect three large summer and winter colonies of the endangered Virginia big-eared bat, *Corynorhinus townsendii virginianus* and one significant hibernaculum of the endangered Indiana bat, from human disturbance. Human disturbance has been identified a major cause of decline in these species. The gates will protect 20 percent of the world's Virginia big-eared bat's summer (maternity) population. Other personnel who were key in the completion of these projects came from the Canaan Valley NWR, Patuxent NWR, Ohio River Islands NWR, Pennsylvania Field Office, American Cave Conservation Association, The Nature Conservancy, U.S. Forest Service, and National Speleological Society Chapters (Grottos) from Ohio, Virginia, West Virginia, Pennsylvania, and Maryland.

### Green River Drainage

A proposal was submitted for funding on March 18, 1996, to the Cave/Karst Subgroup of the ORVE for an environmental assessment of the cave/karst habitat in the Green River drainage. The study objectives were to identify cave resources and contaminant impacts to those resources, to integrate the data into GIS coverages, and to determine priority areas of concern. The results of this study will provide important information for the development of cave habitat protection/restoration plans to be implemented through partnerships with resource management agencies and groups within the ecosystem. The ORVET provided \$5,200 for the study in 1997. Dr. Chris Groves and graduate students at Western Kentucky University conducted the study. A final report and electronic copy of the GIS data have been completed, but have not been submitted to the Service as yet.

### Twin/Donaldson Cave Project

The Twin/Donaldson cave project (water quality and watershed project for the protection of existing cavefish population), was funded by the ORVE in Fiscal Year 1999 with \$5,000. This money was added to an existing and ongoing project known as: Potential Nonpoint-source Contamination of the Spring Mill Lake Drainage Basin sponsored by Indiana Department of Environmental Management. The technical reviews of the final report on the water quality of Donaldson/Bronson/Twin Cave System have been completed. After the suggested modifications have been addressed, the report needs to be reviewed by the Indiana Geological Survey editor and director before it can be released. The report will be released in the near future.

### Summary of Fiscal Year 2000 Accomplishments

#### Cave Management Symposium

Robert Currie, Asheville Field Office, gave a presentation on the protection needs of federally listed cave dependant species at the 1999 Cave Management Symposium in Chattanooga, Tenn. The National Cave Management Symposia are held every two years and are sponsored and coordinated by the Service, the National Park Service, the Bureau of Land Management, the US Forest Service, the National Speleological Society, the American Cave Conservation Society, Bat Conservation International, and others. These meetings were initiated in the mid-70's. They provide an opportunity for Federal, State and private cave managers and owners to share ideas and information on the protection of cave and karst resources. The published proceedings of the Symposia are an excellent source of information on the subject.

#### Kentucky Transportation Cabinet

Robert Currie, Asheville Field Office, gave a presentation on the Endangered Species Act and the protection of cave dependent species at a meeting of the Kentucky Transportation Cabinet and their contractors and consultants. The meeting was held in Bowling Green, Kentucky. Partners in the session on the protection of cave species and the habitats that support them included the Cave Research Foundation, Kentucky Geological Survey, National Speleological Society, American Cave Conservation Association, and the University of Louisville. In addition to endangered species, topics discussed at the meeting included the hydrology, geology, paleontology and archeology of cave and karst systems. Information provided to the participants will enable them to more effectively address and protect cave and karst habitats during the design and construction of highway projects in Kentucky.

#### Wetland, Riparian and Riverine Subgroup

##### Middle Island Creek

The National Resource Conservation Service (NRCS) has agreed to focus \$300,000 of EQUIP funding towards improving the water quality along Middle Island Creek in Pleasant and Tyler Counties. The NRCS will work with local livestock producers on waste and nutrient management and the Service will provide technical support and install livestock exclusion fences and restore any wetlands along the project site. In Fiscal Year 2000, one waste management system was installed by the NRCS and SWCD and approximately 5,000 feet of fence was installed through the Partners for Wildlife Program. Two more projects are being scheduled for Fiscal Year 2001.

##### Killbuck Creek

Also in Fiscal Year 2000, the ORVE Team funded, in part, the placement of a water line and water tanks to keep cattle out of the creek for a livestock producer adjacent to Killbuck Creek in Coshocton County, Ohio. In addition, a feeding pad was constructed to reduce the entry of waste material into Killbuck Creek, the home of the endangered purple cat's paw pearly mussel (*Epioblasma obliquata obliquata*). The site will be monitored by the Reynoldsburg Field Office to determine water quality benefits and if exclusionary fencing is still warranted.

## Summary of Fiscal Year 2000 Accomplishments

### Other Endangered Species Endangered Species Distribution

Progress was made in Fiscal Year 2000 in developing GIS-layer distribution lists by state and county for all federal and state listed endangered, threatened, and candidate species located within the Ohio River drainage. The project will be completed in Fiscal Year 2001, at which time the information will be made available on the ORVE website.

#### Crayfish

A list of the endemic crayfish species of the ORVE and their conservation status was developed. The Endangered Species Subgroup is considering making this group a priority in future work.

#### West Virginia Northern Flying Squirrel

The ORVET provided \$4,000 to the USGS, BRD laboratory in Leetown, W.Va., in Fiscal Year 1999 to conduct genetic studies on the endangered West Virginia northern flying squirrel, *Glaucomys sabrinus fuscus*. To date, numerous hair follicle samples have been submitted to the research to develop a suite of species-specific microsatellite DNA markers. The objectives of the research are to identify population structure, metapopulation extent and evolutionarily significant lineages for the squirrel. At the turn of the century much of the squirrel's habitat was destroyed by logging and fire. The research will to determine if some populations have been reproductively isolated and evolutionarily divergent from other populations. To manage for the future of the squirrel and achieve recovery, it is important to determine what populations have been reproductively isolated. The research is ongoing and is scheduled for completion this winter.

#### Running Buffalo Clover

The ORVET provided \$4,000 in FY 1999 to conduct research on the biology of the endangered running buffalo clover, *Trifolium stoloniferum* on the Fernow Experimental Forest in West Virginia. This is a multi-year study and is ongoing. Preliminary results are showing the disturbance may stimulate growth or at least not prohibit growth and destroy the plant. In partnership with the West Virginia DNR and the USFS, running buffalo clover was being studied to determine its response to disturbance by different silvicultural practices and road construction. Running buffalo clover is thought to be a disturbance species and disturbance from logging may be essential in its management. Other biological needs of the plant will be determined by the research, such as light, moisture, and soil requirements, and pollinators.

### Law Enforcement

#### Contaminants

Committee members conducted some fly overs and inspections of crude oil and oil waste pits during Fiscal Year 2000; however, progress on this task has been limited by the personnel deficit.

### Fiscal Year 2001 Goals

Work Activity Guidance provides guidance to Service field offices working on the ORVE Team, Sub-groups and Standing Committees on high priority Ecosystem Approach Activities during Fiscal Year 2001 . This guidance is not intended to be all inclusive of Service activities within the geographic boundaries of the Ohio River Ecosystem, but to serve the purpose of identifying some important activities which can be accomplished by the Team and its Sub-groups working cross-region and/or cross-program and in cooperation with its other federal, state, non-governmental organization, and other partners.

#### ORVE Team Guidance

- Identify and pursue opportunities to collaborate with federal agency partners and other stakeholders in association with the Ohio River focus area identified by the Midwest Natural Resource Group, consistent with decisions made at the November 1998 Environmental Roundtable and with the Upper Mississippi Basin Partnership.
- Initiate the listing process on the crystal darter (the only known population is in a short reach of the Elk River in West Virginia) to recommend its designation as a candidate species.
- Continue to work closely with the Corps of Engineers, State fish and wildlife agencies, and all pertinent Service field offices on the Corps' Ohio River Mainstem Systems Study to ensure that concerns of the Service relative to fish and wildlife resources and associated habitats are fully considered in this effort and associated efforts to authorize a Water Resources Development Act.

#### Freshwater Mussels

- Continue research on propagation of juvenile mussels in hatcheries.
- Describe the genetics of endangered mussels in the ORVE to facilitate re-introductions and augmentations.
- Review list of mussel species on the previous Service C2 list. Compile data on species that may warrant listing.

#### Migratory Birds

- Work with Partners in Flight, North American Waterfowl Management Plan, and others to coordinate various bird conservation efforts underway within these organizations for the ORVE
- Work with bird conservation organizations, academia, and agencies to identify key migratory bird research needs for the ORVE.
- Continue evaluation of bottomland hardwood forest and riparian resources in the ORVE.
- Work to implement a coordinated bird conservation strategy in the ORVE with a focus on bottomland hardwood forest, riparian, grassland and other important habitats within the ecosystem.

### Fiscal Year 2001 Goals

- Model the probable occurrence of target bird species most in need of conservation in the ORVE using GIS analysis.
- Identify various size classes of forest and grassland habitat based on Partners In Flight and other reference sources concerning theoretical minimum sizes for the identified species of concern using GIS analysis.
- Analyze data and prepare a final report for the research on grassland/savanna bird productivity monitoring in strip mines

### Trust Fishes

- Make progress towards completing a status report on lake sturgeon in the Ohio River Basin.
- Review and prioritize the draft list of fish species of concern in the ORVE. Prepare GIS layers of the ranges of these species.
- Initiate status survey of longhead darter, if funded through the Fiscal Year 2001 flexfund process.
- Support the MICRA Mississippi River Basin Paddlefish Stock Assessment, if funded through the Fiscal Year 2001 flexfund process.
- Determine upstream distribution of exotic fish species in the ecosystem and prepare GIS layers.
- Identify dams in the Ecosystem which are serving as barriers to the upstream distribution of fish.
- Determine overwintering requirements of Ohio River fishes and identify overwintering habitat in the main river, backwaters, and embayments. Research supported under the Cumulative Impacts Studies funded by the Ohio River Mainstem Study.
- Scope the development of a baseline fisheries monitoring plan to measure the effects of Olmstead Lock and Dam on the lower Ohio River; in part through a meeting planned with the Corps of Engineers in late fall.
- Add projects identified by the sub-group as appropriate to the Service's Fisheries Operating Needs System (FONS).

### Cave/Karst Habitat

- Develop a list of federally listed species of concern which occur within ORVE cave/karst systems.
- Identify conservation groups active in cave/karst conservation within the ORVE.
- Identify significant cave/karst habitats within the ORVE. Establish baseline by identifying status and threats for each.



## Fiscal Year 2001 Goals

- Develop and prioritize projects to address information and conservation needs.

### Wetlands

- Develop a firm membership for the subgroup including representatives from each state in the watershed. Recruit non-Service members.
- Develop and prioritize issues affecting the wetland and riparian resources within the ecosystem.
- Identify which issues the subgroup can have the greatest impact on and develop and implement a work strategy to address those issues.
- Develop an outreach plan.

### Endangered Species

- Continue developing GIS layers of distribution by state and county for all Federal and State listed endangered, threatened, and candidate species located within the Ohio River drainage. Make information available on the ORVE website.
- Integrate state-by-state GAP analysis data into the ORVE GIS data system. Use GAP data to assist in the development of endangered species focus area.

### Land Conservation

- Develop goals and criteria, with assistance from subgroup leaders, for land protection in the ORV Ecosystem.
- Working with subgroups and partners, acquire copies of existing landscape level natural resource protection plans for areas within the ORV ecosystem. Compile land protection needs into a draft document outlining various resource needs within the ORVE. Present draft document for review to the various subgroups and the ORVET. Examples of existing sources: Gulf Hypoxia strategy — Dr. William Mitsch, Univ. of Ohio; TNC's Physiographic Conservation Plans; Partners in Flight Bird Conservation Plans; NAWMP; ORV Subgroup Focus Areas; State Heritage Program maps, reports, plans, data.
- Work with ORVET GIS coordinator to identify outstanding GIS layers necessary to predict and display land protection needs. Begin development of a protected lands GIS layer/database.
- With subgroups (Mussels, ES, Cave/Karst, Migratory Birds, Fishes), explore development of an ORV Endangered Species Habitat Protection Strategy that would result in the development of a PPP for all three regions. Focus should be on those species whose recovery plans identify land protection/acquisition as a Priority I task.
- Review the new national Land Acquisition—Remodeling for the Future Policy Plan and R4-R5 regional LA policies and procedures for

## Fiscal Year 2001 Goals

### Land Conservation (continued)

ecosystem teams. Consider and integrate into our own planning process. Tie into Director's priorities.

- Identify and invite partners i.e. TNC, NRCS, state resource agencies, watershed associations, land trusts, to participate in Land Protection Planning Subgroup (this could be moved up in priority).
- Identify restoration and partnership opportunities. Look at high value watersheds.
- Using LAPS as a resource, develop draft ranking criteria for ORVET review of PPI's and PPP's. Check with national LA-Policy Plan.
- Begin planning for an Fiscal Year 2002 land protection workshop that will focus on land protection needs, a particular focus area or endangered species. End product to be a working draft document which specifies locations/acreage/actions needed/partners involved, to reach goals.
- Use concept of "conservation corridors/areas" or "resource concentration areas" and "protection goals" in the development and writings of any plans.

### Law Enforcement

- Expand contaminant work (fly overs and inspections of crude oil and oil waste pits) into Western Pennsylvania, Indiana, Ohio, Kentucky and West Virginia.
- Expand patrols (boat and aircraft) along the Ohio River and its tributaries to halt the unlawful harvest of freshwater mussels.
- Expand efforts to protect fish species from unlawful commercialization.
- Establish a stronger working relationship between the various Federal and State wildlife law enforcement agencies.

**This page left intentionally blank.**